1988
TOMATO PLUG TRANSPLANT
FIELD & GREENHOUSE
STUDIES
(summaries)

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For
The Ontario Tomato Seedling Growers' Marketing Board
Leamington, Ontario
Processing Tomato Transplant Study - 1988
for the
ONTARIO TOMATO SEEDLING GROWERS MARKETING BOARD
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Executive Summaries of:

1.) Project to study the influence of handling various tomato cultivars on survival of Southern (Georgia) transplants under Kent and Essex county field conditions.

2.) Tomato Plug Transplant production study in Southern Ontario Greenhouses.

3.) Tomato Transplant Field Performance Study in Southwestern Ontario.


5.) Comparison of Transplanting Techniques for Tomato Seedlings - 1988 (Engineering Study).
The Influence of Various Handling Systems on Survival of Southern (Georgia) Transplants under Kent and Essex County Field Conditions in 1988

Executive Summary

The study investigated the interrelationships between date of field setting, plant source, cultivar (variety), presorting of plants, soil type and starter fertilizer on final stand of processing type tomato transplants in S.W. Ontario fields.

Sixteen (16) grower cooperators, most on sandy type soils, received Southern transplants from eight (8) sources in Georgia. There were insignificant differences in plant stands and plant losses after three (3) weeks under field conditions with early (before May 10), midseason and late (after May 23), field setting. An initial high plant stand gives no indication on plant survival.

There is no evidence that speed of planting (within a reasonable range of 53 to 70 plants/min.) influences final plant stand nor does slower driving significantly improve plant survival. Rather, field conditions, weather, transplant conditions, cultivar and personnel play a more significant part in regards to plant survival.

It appears that initial plant stands over 95% have significantly decreased loss of plant material after three (3) weeks of field exposure. There is no direct correlation with specific cultivars.

Slight improvements in final plant stands were observed when carefully presorting Southern plants (40 to 60 person hrs./100,000 plants). Plant losses though do not follow the same trends, stands established from zero sorting lost as few plants as those plantings with 84 person hrs./100,000 plants of sorting input.

Average plant loss:  sorted -3.27%
non-sorted -4.07%
difference -0.80%

The decision to sort or to apply starter fertilizer appears to rest with management, individual preference and tradition. There seems no direct relationship with cultivar, condition of plants or plant grower, neither one translates into improved field stands.
Executive Summary

Production systems at fourteen (14) plant growers in Essex and Kent resulted in this analysis of the Ontario Plug Plant Growing Industry. It was attempted to have a cross section of growing structures, heating and watering systems, fertilizer practices, bench types, tray sizes and types as well as management systems represented when samples were taken. The specific objectives were to study the influence and interrelationships of: cultivar (variety), tray type and size, growing medium, fertilizer practices, frequency of watering - on either transplant size and/or final plant stand of commercially usable tray plants.

Results

There are virtually no differences in plant size nor number of plug plants between using deep and shallow 288' trays nor deep 200', but a definite reduction of plant numbers (13%) resulted from the use of 406' trays.

However, caution is advised to draw hasty conclusions, 406' trays constituted less than 1% of our samples. Furthermore, the growing systems were geared towards 288's and 406's certainly will warrant adjustments.

It appears that growers have successfully produced a high proportion of trays with over 85% usable plants/tray; ie. 245 plants/288' Sutton Tray or roughly 4 Trays/1,000 plants. At the time of recording most plants averaged at least 4" (10cm.). The larger plant height experienced in trays with higher plant survival is a direct function of decreased light pushing (stretching) the miniature plug plants upward. Above average plant counts (over 85%) were achieved with the cultivars 9023, 1706, 7814, 6203, 1810, 7107, 2653 and 832. There were no 'poor' growers, or poorly performing cultivars.

One could not establish significant correlations or differences with the various uses of fertilizer and watering practices, nor did any specific growing media have an effect on plant size or resulted in an improved plant count per plug tray.
Tomato Transplant Field Performance Study in S.W. Ontario - 1988

Executive Summary

With thirty-one (31) grower-cooperators on one hundred and four (104) different sites and each local four times replicated, enormous volumes of data were collected during this summer. In a season with environmental extremes such as were experienced in 1988, plant establishment and survival were tested in their extreme limits. The main purpose of this study was to test the viability of locally grown 'plug' transplants were compared to Southern imports. It is estimated that 10% of total tomato transplant requirements were locally produced in 1988.

The majority of yields were in the 15 to 25 ton/ac. range with Berrien Sandy Loam and Brookston Clay leading; no direct patterns could be established to correlate poor or high yields with specific soil types nor with any growers. No correlations exist where high plant stands directly contributed to high yields.

Brookston clay’s and some clay loams held moisture quite well, without resulting directly in significantly better stands nor higher yields.

The season of plant establishment had no influence on final plant stand nor on final yields.

Distribution of samples: 36.5% planted: early - (before May 10)  
27.2% planted: midseason - (May 11-22)  
36.3% planted: late - (after May 23)

It appears that individual field conditions, grower preference and respective management practices have a greater influence on date of planting than soil type itself.

Comparing local transplants with Southern, all twelve (12) cultivars benefited from the use of local transplants by harvesting fields 2 to 6 days earlier, regardless of planting date.

Without question, local plug transplants (93.29%) survived significantly better than Georgia (88.36%) bare root plants. Particularly with the cvs. 2653, 9230, 832 and 6203 local plug plants yielded from 2.05 to 10.97 t/ac. better than fields established from Southern transplants.

There was also no significant correlation between seasons of transplanting, specific cultivars and plant origin relative to final yield. But highest yields were obtained from cv. 832, ranging from 21.85 to 38.52 t/ac. on twelve (12) different sites.
Processing Tomato Replanting Survey - 1988

Summary:

With twenty-one (21) growers, the majority from the Dresden/Tupperville/Wallaceburg area, twenty (20) damaged fields were originally established from:

- Southern Georgian plants, 105.4 Acres or 87.8%
- Local plants (6) 14.8 Acres or 12.2%
- 12.02 Ac. = 100%

Most damage was caused by frost, hail, wind and drought. The majority of fields in this survey were established between May 4 to May 7, a relative early planting date with a high risk factor.
Comparison of Transplanting Techniques for Tomato Seedlings - 1988

Executive Summary

Utilizing local 'plug' tray plants and Southern bare root transplants, conventional 'HOLLAND' and 'MECHANICAL' pocket type transplanters, Mechanical model 1000 and 4000 as well as the LANEN RT-2 rotating cup planter, were compared in extensive field studies involving thirty-one (31) growers across S.W. Ontario.

As different cultivars required an adjustment in plant distances, the "sustained planting rate" (number of openings/min.) were the only direct comparisons between different machines.

An average increase of 122% in the sustained-machine-operating rate/worker/row with the cup type planter over any other machine was noted. Transplanting efficiency is increased significantly when using a streamlined plant handling system.

With a cup type planter, labour requirements were reduced, resulting in an average reduction of 44% or $63.50/ha. employee cost. Total variable input costs, including plants and labour at planting time were comparable or reduced for the cup/carousel system over the conventional gripper (pocket/finger) system using bare root Southern plants. Increasing the number of grippers (pockets) on anyone type transplanter resulted in a higher transplanter efficiency; generally, cup transplanters field set about twice as many transplants per unit of time/worker as finger transplanters, provided that all cups or pockets are 'loaded' with a plant.

Growers should adjust their appropriate ground speed to minimize 'misses', ie. workers placing plants improperly in either type of machine, resulting in unsatisfactory plant stands.

A smaller (10 cm.) plant size, particularly with cup type planters is of great advantage, but planting depth on both types of machines often was difficult to control and maintain using 'plug' tray plants.

Cup type transplanters are comparable, if not superior, to finger (pocket) type machines, provided the handling system is compatible with each individual plant type.